THE

Academy of Natural Sciences

OF

PHILADELPHIA

Meeting

In Memory of Samuel Gibson Dixon, M.D., LL.D., Sc.D.

Legal Acquirements of Doctor Dixon.....By John Cadwalader, LL.D.

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From the Proceedings of the Academy of Natural Sciences of Philadelphia, April, 1918.

April 9.

MEETING
IN MEMORY OF SAMUEL GIBSON DIXON, M.D., LL.D., Sc.D.

Edwin Grant Conklin, Ph.D., Sc.D., Vice-President, in the Chair.

The Presiding Officer, in opening the meeting, remarked:

We have met to commemorate the life and public services of a distinguished man, Samuel Gibson Dixon, who has passed forever from our view, but whose influence and labors will remain long after we also shall have joined the "great majority." Others who knew him most intimately in the various phases of his many-sided life and work will speak at length of his services to science, to the State and to this Academy, but as one who was associated with him for many years in the Council of the society, I cannot refrain from calling attention to the many evidences of his ability and foresight which are all around us. This very hall in which we are meeting we owe to his activities. The Academy had a great history when Dr. Dixon became its President. It had great collections, an unexcelled library, a distinguished scientific staff, and a national and international reputation in science, but it was inadequately housed and endowed. With great energy and ability Dr. Dixon set himself to the task of providing a suitable home and a larger endowment for the institution. Contrast the old building with the present group of buildings, the old Library Hall with this cheerful and inspiring one, the old accommodations for the scientific staff with their present work-rooms and laboratories. We might truly write on his memorial tablet, "He found the Academy crumbling serpentine and left it enduring steel and stone."

Dr. Conklin then presented the Hon. John Cadwalader, Vice-President of the Academy; Witmer Stone, Sc.D., and B. Franklin Royer, M.D., who made the following addresses:—

LEGAL ATTAINMENTS OF DOCTOR DIXON.

BY JOHN CADWALADER, LL.D.

Dr. Samuel Gibson Dixon was a man of such varied abilities and had exerted them to such an unusual degree in benefiting his fellowmen that all phases of his life present points of interest and justify the consideration of his career in its different periods.

In his very early years he exhibited such activity of mind and such earnestness of purpose that his father said of him that "there seemed to be no limitation to his development." When a man has been a successful lawyer, a doctor of medicine, filling an important chair in a leading medical school with high scientific attainments; for twenty-two years the President of the Academy of Natural Sciences of Philadelphia, and in 1905 assuming as Commissioner the entire control of and practically creating the Health Department of the Commonwealth of Pennsylvania under the continuous reappointments by four Governors, it may well be said of him that his life has been remarkable and well spent.

The Chairman has spoken and others will speak of his work for the Academy and for sanitary science. I have been asked to refer to those years during which he devoted himself to the law.

The law has been well called "A Jealous Mistress," requiring untiring attention. Dr. Dixon only entered on the threshold of a lawyer's life and, of course, had not reached the stage of distinction which only comes to men after years of experience. I am sure, however, that his study and limited time in practicing the profession had a distinct influence in his career.

The material growth of industries and commercial interests of all kinds has brought into such prominence the "Captains of Industry" and "Napoleons of Finance" that the great profession of the law is not appreciated as it was half a century ago and for centuries before that time. Lord Campbell, in dedicating his "Lives of the Chief Justices of England" to his son Dudley, wrote: "As you have chosen the noble though arduous profession of the law I dedicate these lives to you in the hope that they may stimulate in your bosom a laudable ambition to excel, and that they may teach you industry, energy, perseverance and self-denial," and "ever bear in mind that truly enviable reputation is only to be acquired by

independence of character, by political consistency and by spotless purity both in public and private life."

Dr. Dixon's early leaning was the study of chemistry and from that to medicine generally. His health, however, as he reached manhood was not good and he went to Europe, visiting Vienna in 1873 during the World's Exhibition held in that year. On his return, when about twenty-five years old, he entered the office of his brother, Edwin S. Dixon, and studied law with him and at the Law School of the University of Pennsylvania, being admitted to the Bar on June 30th, 1877.

It is of interest to recall the fact that Dr. Dixon's immediate predecessor as President of the Academy, Gen. Isaac J. Wistar, was also a man of varied pursuits and until the Civil War practiced law.

In 1886 Dr. Dixon received his degree of Doctor of Medicine from the University of Pennsylvania, so that his years at the Bar were not more than six. The importance of those years in rendering more useful his distinguished career in his later activities is not probably recognized by many.

The training in a lawyer's office before the system of acquiring knowledge of the law entirely in a school, as at present, was of great value. A student under a careful preceptor was guided in his reading and studies. He had the advantage of being able to apply his knowledge to the daily business of the office. Typewriters and stenographers and even office boys had not then been introduced, and all letters and papers were copied, notices were served and messages carried by the students. The student then not only acquired practical knowledge of the duties of a lawyer, but he became known to the members of the Bar and clients in a way that enabled him to gain their confidence if it was deserved.

In an office of general practice every kind of business and occupation and the method of being conducted have to be investigated. A lawyer should be an expert accountant and bookkeeper, with an insight into all commercial and manufacturing methods. Until title companies superseded the work of the *conveyancer*, I mean in the correct sense and not that of a *scrivener*, which is usually meant, the lawyer had to possess the closest familiarity with all the incidents connected with real estate and mortgages and the rights of inheritance. In these and many other fields the lawyer of fifty years ago was very truly *Une homme d'affairés*.

The profession of the law is more important in this country than

in any other, as we live under the written Constitutions of the State and the United States. It is extremely difficult for any man not trained in the law to comprehend his duties as a citizen. We all realize if a Legislature or Congress passes an Act that affects our interests we must consult a lawyer to ascertain how we are to meet its requirements. The recent income tax laws are in point. But very few think of the fundamental constitutional regulations that override and control all legislation. It is largely for these reasons that lawyers have been called upon to fill every class of executive duty. A few years ago a greater number of railroads were presided over by lawyers than by any other class of men, and the great trust companies and even banks seek lawyers as their presiding officers.

I have referred to these facts to apply them to the case of our late President. Short as his career was at the Bar, his keen clear intellect had grasped the main principles of the law and he had entered upon a successful professional life. Admitted in 1877, as early as January Term, 1878, his name appears in the Supreme Court Reports. The case referred to was one involving a nice point of law, and the opposing counsel was a leader of the Bar and one of the most distinguished men in the profession, the Hon. Peter McCall. The case was decided in favor of Dr. Dixon's clients, an important fact for a young advocate.

The office of Edwin S. Dixon and Samuel G. Dixon was noted for its accurate and careful attention to every case and matter submitted to it. In connection with cases involving real estate they were especially competent and met on equal terms the Nestors of that branch of the law at that time, Eli K. Price, Edward Olmstead, William Henry Rawle and Henry Wharton. These were the men at that date who practically controlled all transactions involving land titles. The details of a lawyer's practice are not of general interest, and I do not recall any incident in Dr. Dixon's years at the Bar requiring special mention. What he gained in those eight years of study and practice he never forgot, and those who have been associated with him on the Council of the Academy can all testify as to his clear insight and sound judgment on questions affecting its material interests as distinguished from the scientific work which demanded his greater attention.

Dr. Dixon fully appreciated all that Lord Campbell said of the legal profession and followed his precepts while a lawyer and in all of his other relations in life. He knew that to excel "industry, energy, perseverance and self-denial" were essential. The envia-

ble reputation he secured could not have been acquired without "independence of character and by spotless purity in public and private life."

The interesting home owned and lived in for six generations of his mother's family called "Waverly," where he was born, still belongs to them. Adjoining Bartram's Gardens the three hundred acres reached the Schuylkill River, where, from their own wharf, they shipped the farm products and caught the shad in the spring, justly prized from those waters. The city's growth has destroyed these advantages which the earlier generations enjoyed, but it is rare that any home in this country remains in the possession of the sixth generation of any family.

Interesting as was his early home, his late residence, near the romantic Mill Creek and overlooking the beautiful hills beyond Ardmore with the rare trees and shrubbery and attractive farm land, was one in which he might have passed his latter days in the truest enjoyment. He gave himself no rest, however, and even the hottest days of summer were spent at Harrisburg in the strenuous performance of his great work of protecting the people of his State from the scourge of disease.

Dr. Dixon was essentially a Philadelphian. He possessed that modesty and freedom from the desire for notoriety or personal distinction which has marked so many of the great men of our city and State. This building, in which is now safely housed the invaluable collections which he and his predecessors have obtained and his work in securing pure air and preserving the waters of the State from pollution, are far greater monuments than any column that could be erected in his memory. A plain tablet recording his name, but not his deeds, as in the case of Franklin, is all that is necessary. Dr. Dixon's monuments at least cannot be overlooked.

My warm friendship for Dr. Dixon renders it a pleasure to contribute in any way to the respect which is owed to his memory, and as a lawyer to record the fact of his having been one of that brotherhood.

DOCTOR DIXON'S LIFE AND SERVICES TO THE ACADEMY.

BY WITMER STONE, SC.D.

An institution such as this Academy demands the services of many types of men, and of these three seem to stand out most prominently before us. There is the student of the Natural Sciences, entirely absorbed in his researches, who sheds glory upon the society by his discoveries; the benefactor, through whose generosity these researches are made possible; and the executive, the man of affairs under whose direction the institution is developed.

One of these is equally as important as the other in the welfare of the institution, and lacking any one of the three, successful development is impossible.

It is to the last category that Samuel Gibson Dixon primarily belonged, and it is his untiring energy and devotion in guiding the development of this institution, as executive Curator and President for nearly a quarter of a century, that constitute his great gift to this Academy.

But great as were his services as executive, he was more than this. Directly or indirectly he filled the role of benefactor as well, by securing the funds which made possible the development of the plant of the Academy from the modest building which housed our collections twenty-five years ago to the commodious museum, library and laboratories of to-day. Then, too, his experience in medical research gave him a sympathetic interest in the work of the staff and influenced him in guiding the development of the institution along the lines of scientific research which was its original province and to which its reputation has always been due.

The extent of Dr. Dixon's services to this institution and through it to science in general is appreciated by few outside of our officers and members. It was his later labors in the field of preventive medicine and sanitation, as Commissioner of Health of Pennsylvania, that brought him his great renown, not only throughout the extent of this Commonwealth but far beyond its borders as well, and have made his name a byword in every household of the State, coupled always with the thought of public health. But the details of this work, by far his greatest achievement, as well as his career in the law and its influence on his later activities, are treated of by others,

and I must confine myself to a consideration of his services to this Academy.

Dr. Dixon was born on March 23, 1851, in the old Gibson homestead on the Schuylkill River below Bartram's Garden, where his family had resided since 1721. His father, Isaac Dixon, a respected merchant of Philadelphia, and his mother, Ann Gibson, were members of the Society of Friends, and it was under the influence of the quiet Quaker environment so characteristic of our city that his early life was spent.

As a boy he attended the Friends' School at Fifteenth and Race streets and the Mantua Academy in Philadelphia, then in charge of Prof. Hastings. He later received instruction from private tutors with the idea of preparing for Harvard University. Failure in health, however, necessitated a rest from his studies, which was followed by a trip abroad. Upon his return home all thought of a college course was abandoned and he decided to devote himself to business and the study of law. He took a course in the Mercantile College of Philadelphia and then entered the law offices of his brother, Edwin Saunders Dixon, and attended the Law School of the University of Pennsylvania, being admitted to the Bar in 1877. He continued his law practice for six years, but the necessary confinement and constant strain of office work proved too much for his constitution and once more he was forced to seek rest.

Realizing the necessity for a permanent change of occupation, he now conceived the idea of devoting himself to the scientific side of medicine—a subject which in spite of his choice of the law as a profession had always possessed a deep attraction for him. With this object in view he entered the Medical School of the University of Pennsylvania in the autumn of 1883 and received his degree of M.D. in 1886. He won distinction in his studies and while still an undergraduate was appointed an assistant demonstrator in physiology under the late Harrison Allen.

An attack of typhoid fever during the closing part of his course nearly forced him to abandon his studies, but with characteristic determination he continued his work and passed his examinations. Almost immediately afterward he sailed for Europe, in an effort to regain his health in rest and change of scene. Returning in 1888 he was appointed Professor of Hygiene at the University and soon after became Dean of the Auxiliary Department of Medicine.

In 1889 he again spent several months in Europe, this time in various medical schools in special lines of study connected with

his college work. He took courses in Bacteriology, a science then in its infancy, under Crookshank at King's College, London, and under Klein at the College of State Medicine in the same city, while he studied also under Pettenkofer at Munich, investigating methods of sewage disposal, purification of drinking water and other hygienic subjects.

His duties at the University soon became irksome to him and he longed for more opportunity for original research. He had in 1889 anticipated Koch in the discovery of the branched form of the tubercle bacillus, and had conceived the possibility of the use of an attenuated culture as a preventive of tuberculosis. In experiment he had actually produced immunity in a Guinea-pig, and further investigation of the problem was absorbing all his attention.

As a result he withdrew from the University and determined to establish a private laboratory elsewhere. Through the suggestion of Dr. Henry C. Chapman he came to the Academy of Natural Sciences. Dr. Dixon was elected a member of the Academy February 25, 1890, and in the autumn of that year was granted the use of a room at the eastern end of the old Race street building, which he fitted up as a laboratory. Here for several years, personally and through assistants, he carried on active bacteriological researches. He took part in the meetings of the Academy, became a member of the Microscopical and Biological Section and was elected Professor of Microscopic Technology. He again visited Europe soon after establishing his laboratory at the Academy and made the personal acquaintance of Koch, Virchow and other noted foreign bacteriologists.

Dr. Dixon's intimate association with the Academy naturally led him to take a deep interest in the affairs of the institution and at the close of the year 1891 he was elected a Curator, becoming executive Curator in 1893 and President on December 31, 1895, retaining both offices until the time of his death.

With the assumption of the duties of executive Curator his personal researches in Bacteriology at the Academy, for the time being, came to an end, and his whole time and energy were devoted to the Academy's affairs and to the business management of a large estate of which he was executor.

At the time that his Curatorship began there had been little change in the arrangement of the museum since the Academy had first moved to its present site in 1876. There was but one salaried man in charge of the collections, and while several departments

were in the care of the members of the sections or of individual volunteers, the preservation of most of the historic material belonging to the institution was a serious problem. Dr. Dixon, assuming the position of executive Curator without salary, took over all the responsibilities of the museum management, instituting many reforms and introducing more businesslike methods. Needless to say almost his entire time was spent at the Academy.

Shortly after his election to the presidency the munificent bequest of the late Robert H. Lamborn became available, and he was by virtue of his two offices able not only to direct the general appropriation of this fund, but also to carry out in detail the further development of the museum, which had long been hampered by lack of means. Gradually additions were made to the museum staff until all of the perishable collections were under the care of salaried specialists. By constantly conferring with the members of the staff he ascertained the needs of the several departments and these, under his direction, were provided for as far as possible. Modern cases both for storage and exhibition purposes were installed and the way opened for the accumulation and systematic arrangement of the extensive study collections which have been brought together in recent years, and which have made the Academy more than ever a Mecca for systematists from all parts of the country.

Later Dr. Dixon, largely through his personal efforts, secured several appropriations from the State with which the museum building was enlarged, improved and rendered fireproof—while a new library and a commodious lecture hall were erected, providing for two other important branches of the Academy's activities. The details of all this constructive work—plans, contracts and specifications—he insisted upon attending to in person, as well as carefully superintending the building operations as they progressed. The provision of a fireproof stack for the safeguarding of the priceless library of the Academy was a matter of the greatest satisfaction to Dr. Dixon, as it has been to all who are acquainted with its riches.

In the extension of public education at the Academy, Dr. Dixon took an earnest interest and through his influence the Ludwick Institute, of which he was a director and later Vice-President, was led to establish a course of free public lectures at the Academy under the direction of the Lecture Committee, primarily for the benefit of school children and teachers, in which popular courses in various branches of natural history are given every year.

A mere summary of developments and improvements in such an

institution as this mean but little unless one is familiar with early conditions and those which we face to-day. Many can no doubt remember the cramped antiquated museum building of twenty-five years ago—the scarcity or absolute lack of study material and a single Curator in charge, who from force of circumstances could be little more than a Curator. From this you have seen the development of a great modern museum, with an enormous research collection and a competent staff of specialists constantly engaged in its exploitation and in the preparation of valuable scientific contributions for publication in the Academy's *Proceedings*.

Such a development can only be effected through the wise direction and economic management of a competent executive. In carrying it out Dr. Dixon gained nothing but the satisfaction of a good work brought to completion, while it entailed on his part an amount of voluntary sacrifice of time and energy that few men feel like giving. These are facts that do not show on the surface and are easily forgotten, but they should not be lost sight of in estimating the value of such service.

In June, 1905, Dr. Dixon was appointed Commissioner of Health of Pennsylvania, and immediately began the development of the State department which stands to-day as his greatest monument. Through all these years he maintained his office at the Academy, and many of his plans, especially for the enlargement and improvement of the building, were carried to completion during the period when the multifarious duties of his larger office were such that most men would have found them alone impossible. Naturally, of late years with the activities and responsibilities of the Health Department ever increasing, Dr. Dixon was able to devote less and less time to the Academy, but the planning of earlier years had placed the institution on a basis upon which it ran smoothly and needed less and less the detailed attention of the executive. During his long connection with the Academy Dr. Dixon served upon many of its committees, being Chairman of the Building Committee and also of the Committee in charge of the Centenary Celebration in 1912.

In March, 1892, he was appointed to act for the Academy in conjunction with the State Board of Health in making a bacteriological exhibit at the World's Columbian Exposition at Chicago. He little thought at that time that he would in a few years be head of the department that was to supersede the State Board in caring for the health of the Commonwealth.

During the early nineties he made several communications and

presented several papers at the meetings of the Academy, dealing mainly with the development of *Bacillus tuberculosis*, but including also accounts of *Bacillus typhosis* and *Actinomyces* as well as of beri-beri and the bacteriological examination of drinking water. About this time, through his efforts, the Pennsylvania Antituberculosis Society made the Academy its meeting place and Dr. Dixon became its Vice-President, thus emphasizing his interest in what was to become one of his greatest achievements.

In 1898 Dr. Dixon was appointed on the Board of Public Education in Philadelphia and took an active part in improving the hygienic conditions in the city schools. He was Vice-President of the Zoölogical Society of Philadelphia, a Director of the Wistar Institute of Anatomy, trustee of the University of Pennsylvania, Fellow of the College of Physicians, Past President of the Pennsylvania State Medical Society and a member of numerous medical and scientific organizations. In 1909 the University of Pennsylvania conferred upon him the degree of Doctor of Laws, and in 1916 Lafayette College honored him with the degree of Doctor of Science.

In a life so fully occupied with duties of his official and executive position as was Dr. Dixon's there seemed literally no time for recreation. But in the rare moments when he did indulge in holiday trips or in days of rest in the beautiful country place which he had built at Black Rock, near Bryn Mawr, his deep interest in nature asserted itself. He was always quick to notice unusual birds, striking wild flowers or strange insects, and upon his return to the Academy would seek the aid of specialists in determining their identity and learning something of their history, usually adding some original suggestions as a result of his keen powers of observation. Horticulture, too, was a favorite hobby and the Rhododendron thickets and beds of rare plants that he succeeded in establishing at Black Rock Farm were a source of sincere pleasure and gratification to him.

His visits to the famous tuberculosis sanatorium which he had established at Mont Alto were always a great pleasure to him on account of the splendid mountain scenery and the beauty of the more intimate natural surroundings, of which, on his return, he never failed to speak. This love of nature was always in evidence, and from early youth he had delighted in hunting trips with gun and dogs, which led later to moose hunts in Maine and ducking trips to the clubs of the South Atlantic seaboard. But he indulged in such recreation far too little, especially during the later years of his life,

seeming to neglect in his own case the care that he was ever urging upon others to conserve their strength and health.

Even before his appointment as Health Commissioner those who were closely associated with Dr. Dixon were aware of the inroads that constant attention to his business and executive duties were making upon his health, and on several occasions he had suffered a temporary breakdown. His was a nature that must delve into all the details of every matter under consideration, to make sure that there was no possibility of mistake and that nothing had been overlooked. Praiseworthy as is such a practice, probably no constitution can stand it indefinitely, and in the work of the Department of Health it reached the limit of human endurance.

Even during his long illness, which began about the end of July last, Dr. Dixon's indomitable will continued to assert itself, and for a long while he continued to direct the affairs of his department from his sick bed and to consider the more important matters connected with the administration of the Academy. As time went on, however, he became less and less able to make such effort and the final rest from his labors came on February 26, 1918. Dr. Dixon was married in 1881 to Miss Fanny Gilbert, and she and a daughter, Catharine H. Dixon, survive him.

Dr. Dixon had held the office of President of this Academy longer than any other incumbent, with one exception, having just been elected for his twenty-third term, and no other President had seen, during his administration, such a physical expansion and development of the institution. These things speak for themselves and bear testimony of his executive ability and his devotion to the Academy. To the country at large his work as Commissioner of Health is his monument, and he will stand for all time as an example of the highest ideal of faithful service in public office and as an unselfish benefactor of the people in his campaign for public health.

To those of us who knew him here in the halls of the Academy, however, there will always be memories of the personal side of his relations to the institution and to the staff—his kindliness and sympathy, his interest in the work of every individual, and back of it all that constant desire, ever present, ever conspicuous, to advance the Academy's interests and to meet its needs as he saw them; a service, like that rendered as Commissioner of Health, which brought greater benefits to others than it did to himself.

DOCTOR DIXON'S WORK IN SANITARY SCIENCE.

BY B. FRANKLIN ROYER, M.D.

Acting Commissioner of Health, Commonwealth of Pennsylvania.

The foundation of SAMUEL GIBSON DIXON'S unprecedented accomplishments in sanitary science was laid the day he took up the study of law in the offices of his brother, Edwin Saunders Dixon; and the erection of the superstructure began with his matriculation in the Medical Department of the University of Pennsylvania. It was probably because of his scientific bent of mind and his interest in chemistry and in physiological processes, in good part brought about by a break in health and search for recovery in 1881, that he gave up law and studied medicine. So far as his intimate friends in the medical class of 1886 know, he did not, as a student, give any indication, either that he was especially qualifying for or anticipating a career in preventive medicine. While a student, however, he did show unusual interest in chemistry and in the scientific side of physiology and before the completion of his course he had received an appointment from the University Trustees as Assistant Demonstrator in Physiology, the main chair being so ably filled by the late Harrison Allen. Throughout his life Dr. Dixon repeatedly referred to this pleasant association and to the stimulation for research work given him by his early master in physiology.

The major Medical Faculty of the University of Pennsylvania during the years when Dr. Dixon was a student (1882–1886) included a number of intellectual giants. The Professors in 1885 and 1886 as listed in the annual catalogue of the School of Medicine were as follows:

ALFRED STILLÉ, M.D., LL.D., Emeritus Professor of Theory and Practice of Medicine.
HARRISON ALLEN, M.D., Emeritus Professor of Physiology.
JOSEPH LEIDY, M.D., LL.D., Professor of Anatomy.
RICHARD A. F. PENROSE, M.D., LL.D., Professor of Obstetrics and Diseases of Women and Children.
D. HAYES AGNEW, M.D., LL.D., John Rea Barton Professor of Surgery and Professor of Clinical Surgery.
WILLIAM PEPPER, M.D., LL.D., Professor of Theory and Practice of Medicine and Professor of Clinical Medicine.
WILLIAM GOODELL, M.D., Professor of Clinical Gynecology.
JAMES TYSON, M.D., Professor of General Pathology and Morbid Anatomy.
HORATIO C. WOOD, M.D., LL.D., Professor of Materia Medica, Pharmacy and General Therapeutics.
THEODORE G. WORMLEY, M.D., LL.D., Professor of Chemistry and Toxicology.
JOHN ASHHURST, M.D., Professor of Clinical Surgery.
WILLIAM OSLER, M.D., Professor of Clinical Medicine.

The influence of such a remarkable group of America's greatest medical teachers undoubtedly molded the mind destined to chart so original a course along new public health lines later in life.

Graduating with honor in 1886 at the age of thirty-five years, the doctorate degree was given to a man broken in health, and in the early stage of what proved to be mild enteric fever. By special arrangement his final medical examinations were given prior to his sailing for Europe, the prostrating illness not being definitely diagnosed until Queenstown was reached. Here under the care of Dr. W. L. Townsend, in consultation with the celebrated Sir Lauder Brunton, and later joined by the master in therapeutics, the brilliant Dr. Horatio C. Wood, Dr. Dixon won the battle against what his physicians thought would be a fatal illness. Those of us who have been closely associated with Dr. Dixon's work in sanitary science have always felt that the influences of the kindly and helpful Townsend and the stimulation of the brilliant therapeutist Wood, together with the association and life friendship of the learned Sir Lauder Brunton, influenced the young medical mind to study the then infant branch of hygiene—a branch of medicine at that time receiving its greatest impetus on the continent of Europe, particularly in Germany.

After a prolonged holiday in Europe and complete restoration to health, Dr. Dixon returned to Philadelphia in 1888 and was made Professor of Hygiene in the Medical and Scientific Departments of the University of Pennsylvania, and later in the same medical school year was appointed Dean of the Auxiliary Department of Medicine. Dr. Dixon, while holding this Chair, established the first laboratory of hygiene in the University of Pennsylvania and one of the first on the American continent.

In 1889, several months' study in Europe, undertaken with a resolution to perfect himself to teach the science of bacteriology, brought him under the tutorship of Cruikshank, the celebrated bacteriologist in King's College, London, and gave opportunity for taking a special course in bacteriology under Professor Klein of the College of State Medicine in London. It was while a student under Klein that Dixon made a notable observation, one by which he will perhaps be best remembered as a scientific investigator.

As he sat on his stool in Klein's laboratory, looking through the microscope and carefully searching a well stained slide preparation made from a culture of tubercle bacilli, he made the observation that certain of these organisms were club shaped and others appar-

ently had little shoots or branches. Dr. Dixon was very fond of telling of the skepticism in the minds of the other students of this laboratory, and perhaps even in the thought of open minded Klein himself, when they were permitted to look at the branched forms in this microscopic field. Some said the organisms were lying across each other, or that the end of one bacillus projected against the side of another; but Klein said, "Dixon, if this branching is true, you have made a great scientific discovery." He repeated his work, he checked his technique, he wrote a splendid little paper and illustrated it with a drawing which he made himself, showing the new form. That little paper and that small illustration prepared by the youth in research work attracted the attention of the scientific world and fixed a reputation in science.

This brilliant observation in all probability led him into further research in tuberculosis, but in order to still better equip himself as a teacher of hygiene, he did not return to his Chair without having studied with the most noted hygienist of that time, Pettenkofer of Munich. It was in 1889, while studying in the Laboratory of Hygiene, Munich, so far as we know, that he undertook his first studies in purifying large water supplies and the purification of sewage.

On his return to Philadelphia, late in 1889, he was made Professor of Sanitary Engineering in the University of Pennsylvania, and in October, 1889, we find him publishing a paper on the Treatment of Sewage in London. An opportunity has not been had to review the notes of his lectures given during this school year, but those who had the privilege of listening to his instruction, and who are in a position to contrast this instruction with the practices established under his supervision in the State Department of Health of the Commonwealth of Pennsylvania, see worked out in practical detail what was then considered imaginative and by some medical men almost impracticable and visionary.

In 1890, Dr. Dixon gave up his association with the University of Pennsylvania to become Professor of Bacteriology and Microscopic Technology in the Academy of Natural Sciences of Philadelphia, going there solely in the capacity of a scientific worker. Here he was stimulated by the great Leidy.

During his last college teaching year—to be exact, the 19th of October, 1889—the second event in the unusual career of this unusual man occurred. This date is an important one in the career of him to whom we pay tribute tonight. In the experimental

research work undertaken by Dr. Dixon he found that by introducing old cultures of tubercle bacilli into lower animals a certain degree of immunity was produced, and the publication in the *Medical News* of Philadelphia on the above date preceded by more than six months a similar announcement and publication of similar work—that of the celebrated Koch of Germany. Koch announced somewhat reluctantly that a substance could be produced that would prevent the growth of the tubercle bacillus in the human system.

Following Koch's announcement, Dr. Dixon, with authority from American scientific and medical institutions, visited Europe, interviewed Koch, Virchow, DuBois-Raymond, and many others. At this time he had the privilege of admission to Koch's own laboratory. Europe and America were seething with public interest in tuberculosis. Koch's work, as discoverer of the tubercle bacillus and his later work backed by governmental agencies controlling Germany's laboratories, resulted in robbing Dr. Dixon for a long time of that credit of being the first to produce immunity which should have been given him. In recent years American students of tuberculosis have given this credit to Dr. Dixon and to America.

During the latter part of 1890, while working in his laboratory in the Academy of Natural Sciences, Dr. Dixon developed a tubercle bacillus extract that produces in the lower animals and in human beings that same stimulation toward cure in certain types of the disease that has been found by Trudeau, and other students of pulmonary lesions, to be brought about by the various forms of tuberculin. Later, this same preparation was found by surgeons to be effective in the treatment of certain glandular and genito-urinary types of tuberculosis and ophthalmologists found it equally helpful in the treatment of ocular types.

Dr. Dixon's indefatigable energy and originality were no doubt responsible for his selection in 1892 as Executive Curator in the Academy of Natural Sciences, and it is perhaps here and as Curator, that he developed genius for ocular teaching. This experience as Curator, together with his training in hygiene, led to his appointment as a member of the Board of Public Education in 1898. During the greater part of the six year period in the Board of Public Education Dr. Dixon was Chairman of the Committee on Hygiene. It was during this time that the active campaign was conducted for furnishing public school children of the city of Philadelphia with pure drinking

water. The city water supply at this time was unfiltered, the domestic household supply usually being purified by boiling. Filters were installed. In 1902 the Committee on Hygiene began volunteer medical inspection of the Public School children in Philadelphia, the first place in Pennsylvania to undertake such work.

It was while working in his capacity on the Committee on Hygiene that the genius of the man of science stimulated the completion of plans and models (practically invented) for scientific construction of outlets from wash-basins, sinks, and bath-tubs. An illustrated bulletin by the Commissioner of Health as late as May, 1914, shows how actively his interest in such devices continued throughout his busy career as a public health administrator.

As early as 1890 in the annual oration on hygiene before the Pennsylvania State Medical Society in convention at Williamsport, Dr. Dixon gave evidence of public health foresight by visualizing the future work of a State Health organization. In this address, which was later in good part repeated before the State Board of Health of Pennsylvania on Friday evening, May 15, 1891, Dr. Dixon practically forecast the work of a great State Department of Health. Its development came fourteen years later. In that address Dr. Dixon was consistent with his work in later life in that he outlined ideal precautions for protection against tuberculosis, and even suggested a Cabinet Minister of Health to be as useful as a Cabinet Minister of Agriculture for essential national organization.

Dr. Dixon's foundations for administrative work in sanitary science were well and deeply laid in the twenty-two year interval between the time he gave up law to study medicine and during the period of his teaching and research work. When the invitation came to him from Governor Pennypacker in June, 1905, to organize the State Department of Health, provided for by the three Acts of the Legislature of that year, he came to the work with foundation training in science and big business such as no other man in America had. Dr. Dixon had nothing whatever to do with the drafting of the legislation or securing its adoption. In his pursuit of knowledge of preventive medicine, so far as is known, he had not done so with any thought of accepting an executive position such as was offered him by the Governor. The laws creating the Department were drafted by Dr. Charles B. Penrose and it was almost wholly due to the skill, patience and devotion of Dr. Penrose to a subject in which he had become intensely interested while serving as a member

of the Board of Health in Philadelphia that the laws were properly drafted and their approval secured.

In the selection of Dr. Dixon to be the first Commissioner of Health in Pennsylvania, Governor Pennypacker in his autobiography may be quoted:

"The session of the Legislature ended on the 13th day of April. A Department of Health had been created, to which had been given very great authority and power which extended to the person of the individual citizen and might even be regarded as an infringement of his personal liberty. The value and permanence of the legislation would depend upon the manner in which the department would be organized. It was at first suggested to me that it should be placed in charge of Dr....., but that thought I instantly dismissed. I then had an interview with Dr. Charles B. Penrose, who had been very much interested in the matter, and he named to me a gentleman connected with one of the schools in the Western part of the State. I had a talk with this gentleman, but was still not satisfied. Then Dr. Penrose told me he thought Dr. Samuel G. Dixon, President of the Academy of Natural Sciences, would be willing to undertake the task. That suggestion suited me exactly. Dixon consented and I made the appointment. Under his direction it has come to be accepted as the most important and efficient organization for this line of work in the United States. There is good ground for hope that many of the inflammatory diseases due to specific poisons, such as typhoid fever, smallpox, diphtheria and tuberculosis, may be in time stamped out of existence."

Dr. Dixon was commissioned by Governor Pennypacker on the 6th day of June, 1905, and from that day until the day of his death devoted the greater part of each hour that he was awake to the organization and administration of the State Department of Health. The organization was successful almost immediately for the reason that every new step taken by the Department was carefully thought out before being projected, and because the public were fully taken into the confidence of the Commissioner prior to his enforcing any new plan of procedure.

Knowing the common interpretation that the wielding of police authority extending to the person of an individual citizen for the purpose of protecting all might be regarded as an infringement of personal liberty, Dr. Dixon from the beginning tried to change this general acceptance of the public and to make Pennsylvanians see that in civilized life many primitive and individual liberties must be given up to insure the benefits to be had by public health protection. From the very beginning of the State Department of Health the central thought in its educational work was "how may we get close to the people, and how may we make them see public health problems from the viewpoint of benefits to be obtained." Dr. Dixon's preachment, "Pennsylvania's citizens want to be kept well and in good health and are willing to submit to inconveniences if we only show them what to do"—these and similar slogans reached re-

sponsive chords. Pennsylvania liked this new way of being taken into the confidence of an executive.

It is not possible to faithfully treat of Dr. Dixon's work in sanitary science without speaking in some detail of the great public health organization built by him during the last twelve and a half years of his life. It will likely stand as the greatest monument to his memory.

The law creating the Department of Health centralized the authority in the hands of a single executive, giving him greater power than was given to any other officer of the Commonwealth, save the Governor, and perhaps greater authority than is granted any similar official in America.

With all of this authority in the hands of a man known to be ruggedly honest and gentle as a woman, the public had no fear of usurpation of the unusual authority placed in his hands, and during all the period that he was Commissioner of Health many of the unusual powers that might be needed in case of great emergency were never even given trial.

The first organization undertaken was that of the Bureau of Vital Statistics. Under Dr. Dixon's supervision this bureau was so well planned that before it had been in operation a full year the Federal Census Office credited Pennsylvania with having a better organized agency for gathering vital statistics than any other State in the Union. This bureau consists of a central office under the supervision of the State Registrar and more than 1,100 Local Registrars—one for each civil unit in the State, each Local Registrar having a deputy.

The second division of the Department's organization taken up by Dr. Dixon was that of Medical Inspection. Before this division had been in operation a year it was found that all previous plans for public health organization in the civil sub-divisions known as second class townships were inoperative, and that in many of the small boroughs similar inaction was seen.

For the first two years the Division of Medical Inspection was largely engaged in handling epidemics too extensive for local health organizations to cope with, and in helping lame health organizations to form working bodies.

In 1907, however, all second class townships were formed into 720 sanitary districts, and it was suggested to the Legislature that the law providing for school boards to act as Boards of Health therein be repealed. The advice was followed and at once the

Department assumed entire executive supervision over public health matters in a population of more than two million souls.

In all of the countryside, as well as in small boroughs, details were worked out for handling quarantine just as it is done in our large cities. It is fair at this time to say that a great deal of the reduction in sickness from communicable diseases in our larger centers of population is due to establishing proper regulations in the unorganized country villages and on farmsteads, such points prior to that time often feeding infection through food supplies or by visits into the larger centers of population.

The third great division of the Department's organization taken up was that of Sanitary Engineering. One of the Acts upon which the Department is based provided for the prevention of pollution of streams, and Department measures had to be perfected for approving, according to the Act, the plans for all water works and sewage treatment plants. Studies had to be made looking toward the requiring of many cities to build sewage purification works so that municipalities down stream might not be continuously poisoned by filth entering from the neighboring city above.

The amount of work required to supervise and intelligently approve the hundreds of plans brought before the Commissioner in this period of time was in itself almost a full task for one well trained sanitarian. For every set of plans that came before the Commissioner of Health completed and safe for approval in all details, two sets of plans required rejection in some particular, and a goodly number during the early days of the Department required rejection in toto.

The Division of Laboratories was organized as soon as the other divisions were well planned, the organization being made with a threefold purpose in view:

First, to afford doctors in the Commonwealth remote from instruments of precision opportunity to study their cases in a scientific way and to apply modern methods of treatment.

Seeond, to properly check the operation of water filtration and sewage purification plants and to coördinate the engineering studies with end results.

Third, with the purpose of undertaking such research work as might be advisable.

Division of Distribution of Biological Produets.—Early in the history of the Department plans were made for averting the needless sacrifice of life to the ravages of diphtheria. The Attorney

General ruled that the appropriation items were so liberal in their wording that the purchasing of diphtheria antitoxin would be permissible. Stations were established in all populous centers in the Commonwealth and antitoxin was placed within the reach of all Pennsylvania doctors for use in treating the poor.

Divisions of Accounting and Purchasing and Supplies.—From the very beginning of the Department's organization up to the present time systematic keeping and auditing of accounts, and purchasing and distribution of supplies were carried out with precision creditable to a large business concern. Two divisions were devoted to this portion of the Department's business and work, thus giving the executives of the other divisions all of their time for essential public health details.

So firmly had the organization worked out in 1905 been established by 1907, that when the Legislature of that year came to fulfill the campaign pledges of both great political organizations to support an anti-tubercuIosis campaign, they deliberately voted $1,000,000 to the Department of Health to start the work. This was done so that the organization incident to the conducting of a chain of dispensaries and the building of tuberculosis sanatoria for the poor might be worked out along the same lines followed in the organization of the new Health Department. To properly undertake this new line of work, two new divisions were organized —one of Tuberculosis Sanatoria and the other of Dispensaries.

This tuberculosis work lay nearest Dr. Dixon's heart and into its organization he put the best that was in him. Twenty-three hundred free beds in three great sanatoria in the Pennsylvania mountains, and one hundred and fifteen dispensaries, each with its quota of physicians and nurses, followed.

The work of these various divisions was extended and broadened from time to time, each division taking on its new load as directed by the Commissioner. Year after year elapsed, Dr. Dixon being appointed by Governor after Governor, and from time to time the Legislature broadened and made heavier the load by providing additional lines of work and liberal funds for its execution.

In 1915 a Bureau of Housing was created. An organization had to be planned to direct work over the entire State with the exception of first class cities, working for the most part through local health organizations in boroughs, second and third class cities. The Bureau was planned to improve living conditions of the poor, and especially to improve sanitary conditions as affecting the lives and health of infants and children and of workers.

Division of Public Service.—A law enacted during the same session of the Legislature provided for the medical inspection of hotel and restaurant employés, and prohibited the use of the common towel and public drinking cup. An additional division had to be organized for handling this work. During the last months of Dr. Dixon's life three additional divisions were planned.

First, a Division for the control of the sale of narcotics, created by a special Act of 1917.

Second, a Division of Child Hygiene, planned and organized to meet the unusual conditions to which the lives of children would be subjected during the high tension period of the war.

Third, a Division for the Treatment of Venereal Diseases, planned not only with the hope of ameliorating suffering and protecting America's selective service men, but with the purpose of placing within reach of the poor those specifics which, when properly applied, might lessen the chances of visitation unto the second and third generations and salvage many lives that might otherwise be wrecked.

Throughout the twelve and a half year period the Commissioner of Health received from his Bureau and Division Chiefs, and through them from the field forces throughout the Commonwealth, information of vital importance to the public. The volume of such information arriving in the central office was enormous, and the subdivisions of the Commissioner's executive staff assisted him in coördinating, digesting, abstracting and reflecting back to the public all those essential details helpful in keeping the public fully informed as to results obtained in making them see that the promises held forth at the time of launching any new line of work were being kept.

The difficulties in the way of perfecting such an organization were not always easily overcome. The Governor, as well as each of his three successors, placed entire confidence in Dr. Dixon and gave him full liberty in organization and freedom from political interference. It is but fair to say that not a single important executive appointment was made to gratify political ambition or to satisfy political recommendation. It very often happened, later in the executive work of Dr. Dixon, that the prominent political leader, who felt hurt that his insistent recommendation could not be complied with, was big enough and broad enough to later come back to Dr. Dixon and say, "I felt at the time you refused my request that you were making a mistake in taking the attitude you did concerning the health organi-

zation. I am convinced, however, that you are right and am glad to tell you so."

During the time that has elapsed since the organization of the Department was fairly well launched in 1906 until the end of 1917, 2,640,000 birth certificates, 1,500,000 death certificates, and 840,000 marriage certificates have been received, catalogued, bound, filed and stored in fireproof vaults of the State Capitol, where they are available for all legal and statistical purposes.

Two hundred thousand persons have been quarantined in rural districts for the various communicable diseases, with subsequent sanitary cleansing and disinfection of premises, and breaking the continuous chain of infection leading from farmstead to town and city and back again to farm. One hundred and twenty thousand dairy farm inspections have been made, and 2,500,000 school children in fourth class district schools have been examined with recommendations to parent or guardian for correcting defects.

Two hundred and eighty-four plans for water works and sewage treatment plants have been filed, studied and approved. 2,274 decrees have been issued requiring the installation of sewage works and water works, and 150 separate pollutions have been removed from streams.

One hundred and seven thousand three hundred and sixty-three patients have been treated at the tuberculosis dispensaries. 1,250,348 visits have been made to the homes of these patients for the purpose of giving practical teaching and sanitary instruction. Nearly 30,000 poor patients have been treated and educated at the Department's tuberculosis sanatoria.

The amount of work done in the Division of Laboratories for physicians of the Commonwealth was enormous, more than 20,000 specimens being examined monthly and scientific reports made to the family doctor.

Since the distribution of antitoxin was begun in 1905 until the end of the last statistical year 300,000 packages of diphtheria antitoxin were distributed free to the poor, 2,000 persons have been immunized against tetanus; nearly 50,000 against smallpox; and large numbers of persons were immunized against typhoid fever.

During the twelve and three quarter years' period when Dr. Dixon was Commissioner of Health in the Commonwealth of Pennsylvania there was appropriated to his Department and expended in the promotion of public health, including the treating of the tuberculous sick, more than twenty million dollars of State

funds, and yet no criticism of this expenditure has been uttered. During this period in his official capacity as Commissioner of Health, he superintended activities extending to every municipality in the Commonwealth. He exercised advisory and supervisory control over the many public health organizations in the State, always leading and setting an example in every line of public health work. These many smaller health organizations, recognizing Dr. Dixon as a central figure, and stimulated by his work, exerted themselves to their utmost. The resulting saving of life is shown by the fact that in the year 1906 when the State Health Department was reorganized, the death rate in the State was 16 per thousand, and in 1917 it had declined to 14.7. This indicates a saving of 120,266 lives in the Commonwealth.

As a fitting stamp of approval of the sanitary work of Dr. Dixon, the Pennsylvania State Medical Society, after eleven years of enforcing police law (and sometimes in a drastic way against medical men), elected him to its highest office. He passed away while serving as President of the Society. His death was mourned most sincerely. The editorial notices written after Dr. Dixon's death were most unusual and show how he had inspired the confidence of the people.

Dr. Conklin.—The addresses to which we have just listened have revealed to us a man of unusual ability and achievements, one who succeeded not merely in one profession but in several, and who has left upon his city, State and nation an enduring impression. "Si monumentum quaeris, circumspice." He died too soon, in the thick of work, in the midst of public service. Now he rests from his labors and his works do follow him. Peace to his ashes, honor to his memory.